

In the Claims

1-4. (cancelled)

5. (currently amended) A method according to claim 1, of curing a composition comprising

(a) at least one free-radical-polymerisable compound or

(b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

(c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

a mixture of components (a) and (b), or

a mixture of components (a) and (c); and

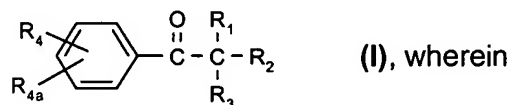
(d) at least one photolabile compound that is activatable by plasma discharge;

wherein

the composition is applied to a three-dimensional substrate and

the curing is carried out in a plasma discharge chamber

wherein component (d) in the composition is at least one compound selected from the group consisting of formula I, II [(I), III] and IV



R₁ is C₁-C₁₂alkyl or C₁-C₁₂alkoxy;

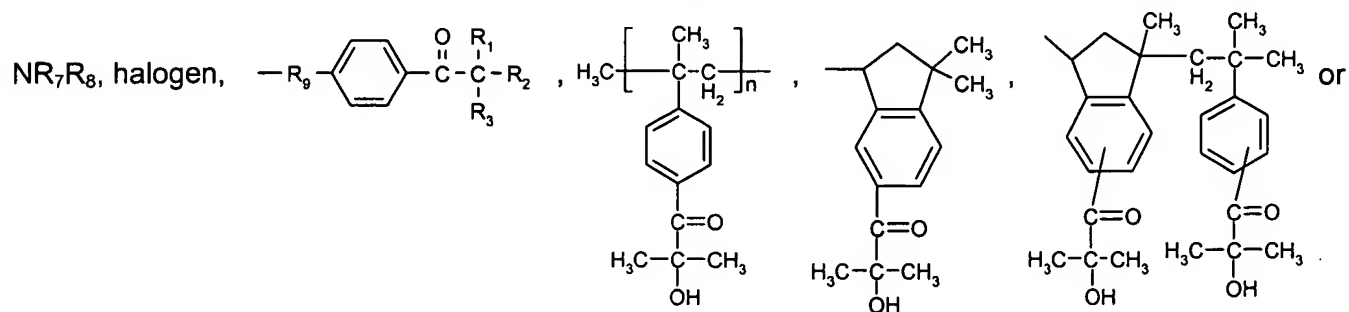
R₂ is phenyl, OR₅ or NR₇R₈;

R₃ has one of the definitions given for R₁ or is C₃-C₁₂alkenyl, phenyl-C₁-C₆alkyl or C₁-C₆alkyl-phenyl-C₁-C₆alkyl;

or R₁ and R₃, together with the carbon atom to which they are bonded, form a cyclohexyl ring;

R₂ being phenyl when R₁ and R₃ are both alkoxy;

R_4 and R_{4a} are each independently of the other hydrogen, C_1 - C_{12} alkyl, C_1 - C_{12} hydroxyalkyl, OR_5 , SR_6 ,

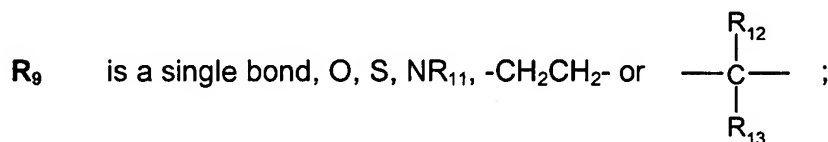


a monovalent linear or branched siloxane radical;

n is a number from 1 to 10;

R_5 and R_6 are each independently of the other hydrogen, C_1 - C_{12} alkyl, C_1 - C_{12} alkenyl, phenyl, benzyl, $Si(CH_3)_3$ or $-[C_aH_{2a}X]_b-R_{10}$;

R_7 and R_8 are each independently of the other hydrogen, C_1 - C_{12} alkyl or C_2 - C_5 hydroxyalkyl, or R_7 and R_8 , together with the N atom to which they are bonded, form a 5- or 6-membered ring, which may also contain O atoms or a NR_{11} group;



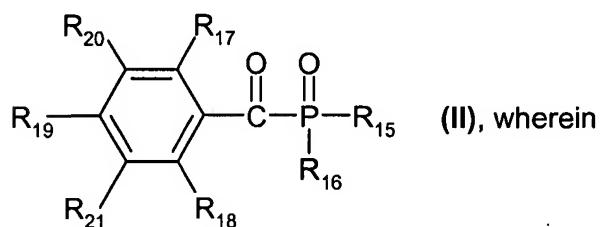
a and b are each independently of the other a number from 1 to 12;

X is S, O or NR_{11} ;

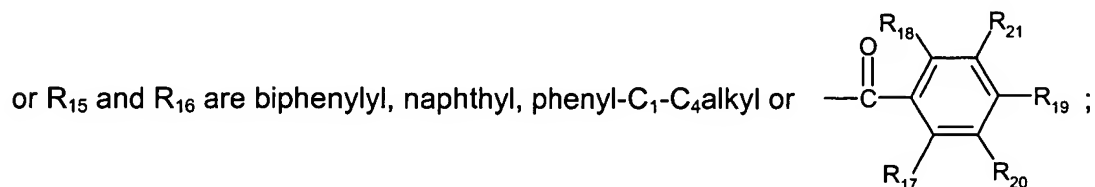


R_{11} is hydrogen, phenyl, phenyl- C_1 - C_4 alkyl, C_1 - C_{12} alkyl or C_2 - C_5 hydroxyalkyl; and

R_{12} , R_{13} and R_{14} are each independently of the others hydrogen or methyl;



R_{15} and R_{16} are each independently of the other C_1 - C_{12} alkyl, C_1 - C_{12} alkoxy; phenyl which is unsubstituted or substituted by one or more OR_{22} , SR_{23} , $NR_{24}R_{25}$, C_1 - C_{12} alkyl or halogen substituents;

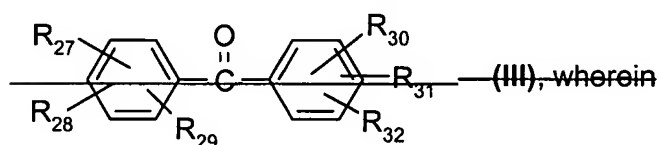


R_{17} and R_{18} are each independently of the other C_1 - C_{12} alkyl, C_1 - C_{12} alkoxy, CF_3 or halogen;

R_{19} , R_{20} and R_{21} are each independently of the others hydrogen, C_1 - C_{12} alkyl, C_1 - C_{12} alkoxy, CF_3 or halogen;

R_{22} , R_{23} , R_{24} and R_{25} are each independently of the others hydrogen, C_1 - C_{12} alkyl, C_2 - C_{12} alkenyl, C_3 - C_8 cycloalkyl, phenyl, benzyl, or C_2 - C_{20} alkyl which is interrupted by O atoms and is unsubstituted or substituted by OH or/and SH; or R_{24} and R_{25} , together with the N atom to which they are bonded, form a 5- or 6-membered ring, which may also contain O or S atoms or an NR_{26} group; and

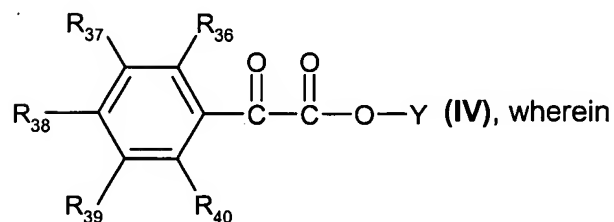
R_{26} is hydrogen, phenyl, phenyl- C_1 - C_4 alkyl, C_1 - C_{12} alkoxy, C_1 - C_{12} alkyl or C_1 - C_{12} hydroxyalkyl;



~~R_{27} , R_{28} , R_{29} , R_{30} , R_{31} and R_{32} are each independently of the others hydrogen, C_4 - C_4 alkyl, phenyl, naphthyl, OR_{35} , SR_{35} , $(CO)O(C_4$ - C_4 alkyl), halogen, $NR_{33}R_{34}$ or a monovalent linear or branched siloxane radical, or R_{29} and R_{30} , each in the o position to the carbonyl group, together form a S atom; and~~

~~R_{33} and R_{34} are each independently of the other hydrogen, C_4 - C_4 alkyl, C_2 - C_6 hydroxyalkyl, or R_{33} and R_{34} together with the N atom to which they are bonded, form a 5- or 6-membered ring, which may also contain O atoms or a NR_{44} -group; and~~

~~R_{35} is C_4 - C_{12} alkyl, C_2 - C_6 hydroxyalkyl or phenyl;~~



R_{36} , R_{37} , R_{38} , R_{39} and R_{40} are each independently of the others hydrogen, C_1 - C_{12} alkyl unsubstituted or substituted by OH, C_1 - C_4 alkoxy, phenyl, naphthyl, halogen, CN and/or by $-OCOR_{41}$, or C_2 - C_{12} alkyl

which is interrupted by one or more O atoms, or R_{36} , R_{37} , R_{38} , R_{39} and R_{40} are OR_{42} , SR_{43} , $NR_{44}R_{45}$, halogen, a monovalent linear or branched siloxane radical, or phenyl unsubstituted or substituted by one or two C_1 - C_4 alkyl or/and one or two C_1 - C_4 alkoxy substituents, it being possible for the substituents OR_{42} , SR_{43} , $NR_{44}R_{45}$ to form 5- or 6-membered rings by way of the radicals R_{42} , R_{43} , R_{44} and/or R_{45} with further substituents on the phenyl ring or with one of the carbon atoms of the phenyl ring;

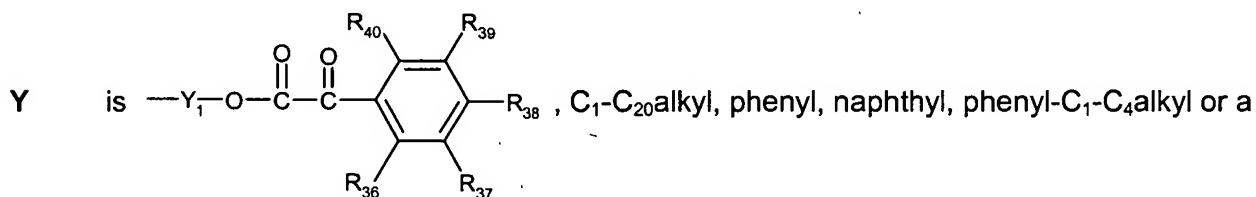
R_{41} is C_1 - C_8 alkyl, or phenyl unsubstituted or substituted by from one to three C_1 - C_4 alkyl and/or one to three C_1 - C_4 alkoxy substituents;

R_{42} and R_{43} are each independently of the other hydrogen, C_1 - C_{12} alkyl unsubstituted or substituted by OH, C_1 - C_4 alkoxy, phenyl, phenoxy or/and by $-OCOR_{41}$, or C_2 - C_{12} alkyl which is interrupted by one or more O atoms, or R_{42} and R_{43} are phenyl unsubstituted or substituted by C_1 - C_4 alkoxy, phenyl or/and by C_1 - C_4 alkyl, or R_{42} and R_{43} are C_3 - C_6 alkenyl, cyclopentyl, cyclohexyl or naphthyl;

R_{44} and R_{45} are each independently of the other hydrogen, C_1 - C_{12} alkyl unsubstituted or substituted by OH, C_1 - C_4 alkoxy or/and by phenyl, or C_2 - C_{12} alkyl which is interrupted by one or more O atoms, or R_{44} and R_{45} are phenyl, $-COR_{41}$ or SO_2R_{46} , or R_{44} and R_{45} , together with the nitrogen atom to which they are bonded, form a 5-, 6- or 7-membered ring, which may also be interrupted by $-O-$ or $-NR_{47}-$;

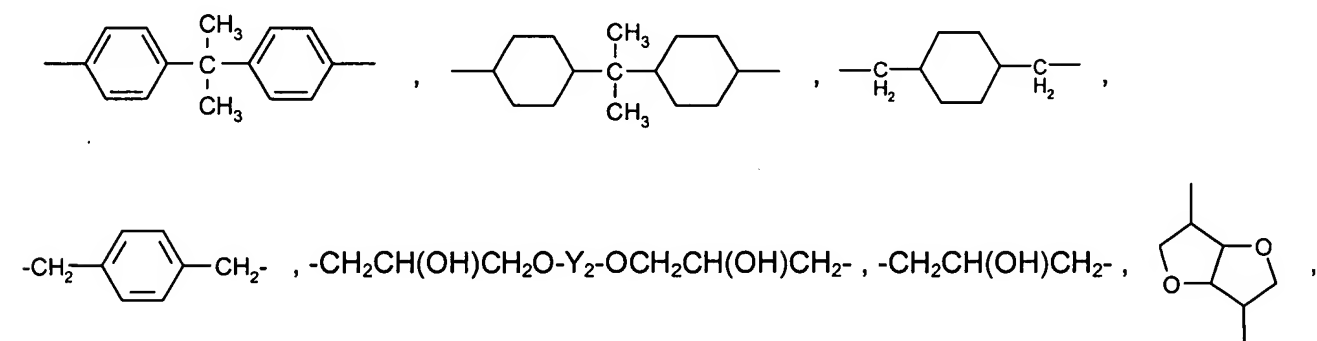
R_{46} is C_1 - C_{12} alkyl, phenyl or 4-methylphenyl;

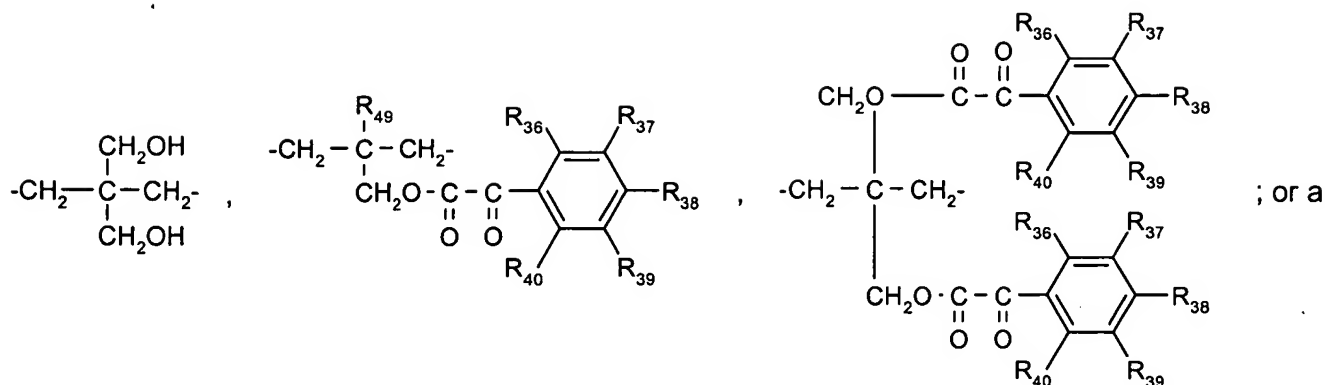
R_{47} is hydrogen, C_1 - C_8 alkyl unsubstituted or substituted by OH or by C_1 - C_4 alkoxy, or is phenyl unsubstituted or substituted by OH, C_1 - C_4 alkyl or by C_1 - C_4 alkoxy;



monovalent linear or branched siloxane radical;

Y_1 is C_1 - C_{12} alkylene, C_4 - C_8 alkenylene, C_4 - C_8 alkynylene, cyclohexylene, C_4 - C_{40} alkylene interrupted by one or more $-O-$, $-S-$ or $-NR_{48}-$, or is phenylene or Y_1 is a group





divalent linear or branched siloxane radical;

Y_2 has the same definitions as Y_1 with the exception of the formula

$-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{O}-\text{Y}_2-\text{OCH}_2\text{CH}(\text{OH})\text{CH}_2-$;

R_{48} is hydrogen, C_1 - C_{12} alkyl or phenyl; and

R_{49} is hydrogen, CH_2OH or C_1 - C_4 alkyl.

6. **(previously presented)** A method according to claim 5, wherein component (d) in the composition is at least one compound selected from the group consisting of formula I and II.

7. **(currently amended)** A method according to ~~claim 1, of curing a composition comprising~~

(a) at least one free-radical-polymerisable compound or

(b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

(c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

a mixture of components (a) and (b), or

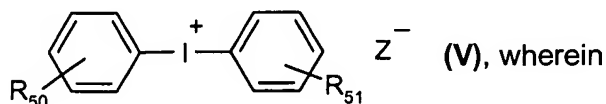
a mixture of components (a) and (c); and

(d) at least one photolabile compound that is activatable by plasma discharge;

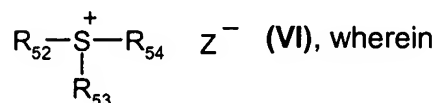
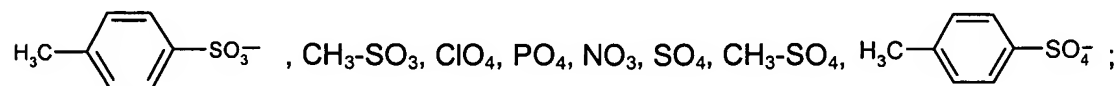
wherein

the composition is applied to a three-dimensional substrate and

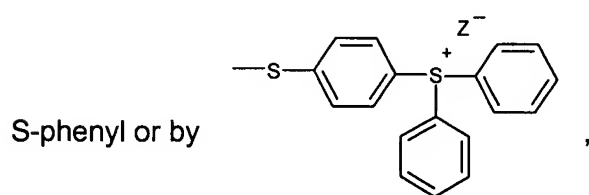
the curing is carried out in a plasma discharge chamber wherein component (d) in the composition is at least one compound selected from the group consisting of formula V, VI, VII and VIIa



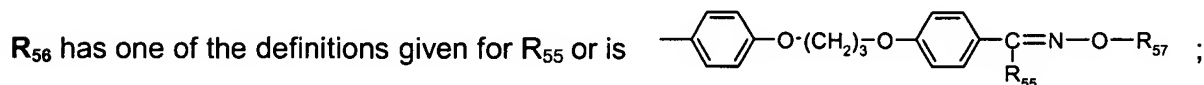
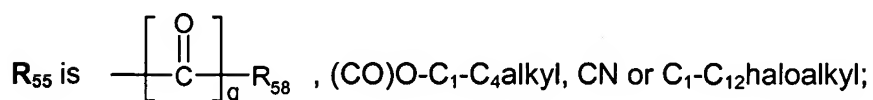
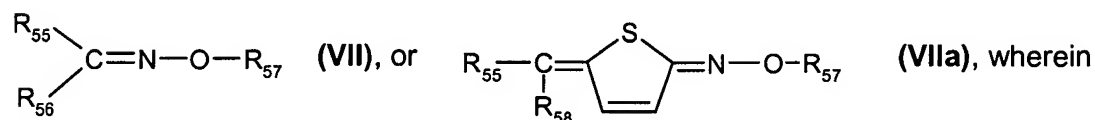
R_{50} and R_{51} are each independently of the other hydrogen, C_1 - C_{20} alkyl, C_1 - C_{20} alkoxy, OH-substituted C_1 - C_{20} alkoxy, halogen, C_2 - C_{12} alkenyl, cycloalkyl, especially methyl, isopropyl or isobutyl; and Z is an anion, especially PF_6 , SbF_6 , AsF_6 , BF_4 , $(C_6F_5)_4B$, Cl , Br , HSO_4 , CF_3-SO_3 , $F-SO_3$,



R_{52} , R_{53} and R_{54} are each independently of the others unsubstituted phenyl, or phenyl substituted by –

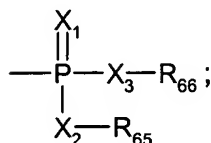


Z is as defined above;



R_{57} is C_1 - C_{18} alkylsulfonyl, C_1 - C_{10} haloalkylsulfonyl, camphorylsulfonyl, phenyl- C_1 - C_3 alkylsulfonyl, C_3 - C_{30} cycloalkylsulfonyl, phenylsulfonyl, naphthylsulfonyl, anthracylsulfonyl or phenanthrylsulfonyl, unsubstituted or substituted by one or more halogen, C_1 - C_4 haloalkyl, CN , NO_2 , C_1 - C_{16} alkyl, phenyl, C_1 - C_4 alkylthio, C_1 - C_4 alkoxy, phenoxy, C_1 - C_4 alkyl- $O(CO)-$, C_1 - C_4 alkyl- $(CO)O-$, $R_{67}OSO_2-$ and/or

-NR₆₀R₆₁ substituents; or R₅₇ is C₂-C₆haloalkanoyl, halobenzoyl, $\begin{array}{c} \text{X}_1 \\ \parallel \\ \text{---P---R}_{64} \\ | \\ \text{R}_{63} \end{array}$, $\begin{array}{c} \text{X}_1 \\ \parallel \\ \text{---P---R}_{64} \\ | \\ \text{X}_2\text{---R}_{65} \end{array}$ or



X₁, X₂ and X₃ are each independently of the others O or S;

q is 0 or 2; and

R₅₈ is C₁-C₁₂alkyl, cyclohexyl, camphoryl, unsubstituted phenyl, or phenyl substituted by one or more halogen, C₁-C₁₂alkyl, OR₅₉, SR₅₉ or NR₆₀R₆₁ substituents;

R₅₉ is C₁-C₁₂alkyl, phenyl, phenyl-C₁-C₄alkyl or C₁-C₁₂hydroxyalkyl;

R₆₀ and R₆₁ are each independently of the other hydrogen, C₁-C₄alkyl, C₂-C₆hydroxyalkyl, or R₆₀ and R₆₁, together with the N atom to which they are bonded, form a 5- or 6-membered ring, which may also contain O atoms or an NR₆₂ group;

R₆₂ is hydrogen, phenyl, phenyl-C₁-C₄alkyl, C₁-C₁₂alkyl or C₂-C₅hydroxyalkyl;

R₆₃, R₆₄, R₆₅ and R₆₆ are each independently of the others C₁-C₆alkyl, C₁-C₆haloalkyl; or phenyl unsubstituted or substituted by C₁-C₄alkyl or by halogen; and

R₆₇ is hydrogen, C₁-C₄alkyl, phenyl or tolyl.

8. (cancelled)

9. (currently amended) [[A]] The method according to claim [[1]] 5, wherein the composition comprises, in addition to the photolabile component (d), other additives (h), sensitizer compounds (f) or/and dyes or pigments (g).

10. (currently amended) [[A]] The method according to claim [[1]] 9, wherein the composition comprises at least one light stabiliser or/and at least one UV absorber compound.

11. (currently amended) [[A]] The method according to claim [[1]] 5, wherein the composition is a surface coating.

12. (currently amended) [[A]] The method according to claim [[1]] 5, wherein the composition is a printing ink.

13. **(currently amended)** **[[A]]** The method according to claim **[[1 or]]** 5, wherein the composition comprises as polymerisable component solely free-radical-polymerisable compounds (a).

14. **(currently amended)** **[[A]]** The method according to claim 13, wherein the free-radical-polymerisable compound comprises at least one compound selected from the group consisting of mono-, di-, tri- or tetra-functional acrylate monomers and mono-, di-, tri- or tetra-functional acrylate-functional oligomers.

15. **(currently amended)** **[[A]]** The method according to claim **[[1]]** 5, wherein the composition comprises as polymerisable component solely cationically polymerisable or crosslinkable compounds (b).

16. **(currently amended)** **[[A]]** The method according to claim **[[1]]** 5, wherein the composition comprises as polymerisable component a mixture of at least one free-radical-polymerisable compound (a) and at least one cationically polymerisable compound (b).

17. **(currently amended)** **[[A]]** The coated substrate which is coated on at least one surface by means of the method according to claim **[[1]]** 5.

18. **(currently amended)** A coating ~~obtainable~~ obtained by a method according to claim **[[1]]** 5.

19. **(currently amended)** A method of curing a composition comprising

(1) a combination of at least one electron acceptor maleimide compound and at least one electron donor vinyl ether compound; and

(2) optionally at least one free-radical-polymerisable compound (a),
wherein the curing is carried out in a plasma discharge chamber.

20. **(currently amended)** **[[A]]** The method according to claim 5 of curing a composition comprising

(a) at least one free-radical-polymerisable component having at least one ethylenically unsaturated double bond, the free-radical-polymerisable component optionally additionally being functionalised with OH, NH₂, COOH, epoxy or NCO groups; and

(a1) a mixture of at least one compound selected from the group consisting of polyacrylates and polyester polyols,

and at least one compound selected from the group consisting of melamine, melamine derivatives and blocked or non-blocked polyisocyanates;

or

(a2) a mixture of at least one compound selected from the group consisting of carboxyl-, anhydride- or amino-functional polyesters and carboxyl-, anhydride- or amino-functional polyacrylates,

and at least one compound selected from the group consisting of epoxy-functional polyesters and polyacrylates;

or

(a3) a mixture of (a1) and (a2); and

(d) at least one photolabile compound of that is activatable by plasma discharge selected from the group consisting of formula I, II, and IV;

wherein

the curing of the composition is carried out in a plasma discharge chamber and, optionally, thermal pre- or after-treatment is carried out.

21. **(currently amended)** [[A]] The method according to claim 5 of producing mouldings from composite materials, wherein a support is impregnated with [[a]] the composition comprising

(a) at least one free-radical-polymerisable compound or

(b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

(c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

a mixture of components (a) and (b), or

a mixture of components (a) and (c); and

(d) at least one photolabile compound that is activatable by plasma discharge selected from the group consisting of formula I, II, and IV;

and is introduced into a mould;

wherein the curing is carried out in a plasma discharge chamber and, optionally, thermal aftertreatment is carried out.

22 27. **(cancelled)**

28. **(currently amended)** ~~[[A]]~~ The method according to claim ~~[[2]]~~ 7, wherein the composition comprises, in addition to the photolabile component (d), at least one light stabiliser or/and at least one UV absorber compound and optionally other additives (h), sensitizer compounds (f) or ~~[[/and]]~~ dyes or pigments (g).

29-37. **(cancelled)**

38. **(new)** The method according to claim 7, wherein the composition is a surface coating.

39. **(new)** The method according to claim 7, wherein the composition is a printing ink.

40. **(new)** The method according to claim 7, wherein the composition comprises as polymerisable component solely cationically polymerisable or crosslinkable compounds (b).

41. **(new)** The method according to claim 7, wherein the composition comprises as polymerisable component a mixture of at least one free-radical-polymerisable compound (a) and at least one cationically polymerisable compound (b).

42. **(new)** The method according to claim 7 of curing a composition comprising

(a) at least one free-radical-polymerisable component having at least one ethylenically unsaturated double bond, the free-radical-polymerisable component optionally additionally being functionalised with OH, NH₂, COOH, epoxy or NCO groups; and

(a1) a mixture of at least one compound selected from the group consisting of polyacrylates and polyester polyols, and at least one compound selected from the group consisting of melamine, melamine derivatives and blocked or non-blocked polyisocyanates;

or

(a2) a mixture of at least one compound selected from the group consisting of carboxyl-, anhydride- or amino-functional polyesters and carboxyl-, anhydride- or amino-functional polyacrylates, and at least one compound selected from the group consisting of epoxy-functional polyesters and polyacrylates;

or

(a3) a mixture of (a1) and (a2); and

(d) at least one photolabile compound of that is activatable by plasma discharge selected from the group consisting of formula V, VI, VII and VIIa;

wherein

the curing of the composition is carried out in a plasma discharge chamber and, optionally, thermal pre- or after-treatment is carried out.

43. (new) The method according to claim 7 of producing mouldings from composite materials, wherein a support is impregnated with the composition comprising

- (a) at least one free-radical-polymerisable compound or
 - (b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or
 - (c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or
- a mixture of components (a) and (b), or
a mixture of components (a) and (c); and
- (d) at least one photolabile compound that is activatable by plasma discharge selected from the group consisting of formula V, VI, VII and VIIa;
and is introduced into a mould;

wherein the curing is carried out in a plasma discharge chamber and, optionally, thermal aftertreatment is carried out.